

IN THE CLAIMS:

Please amend claims 1-4, 6, 8 and 9 and add the following new claims as shown below:

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1. (currently amended) An optical apparatus comprising:
a metal member that is disposed on a substrate and has a caspidal-tip part;
a light source device for modulating the direction of polarization;
an optical member for irradiating the caspidal-tip part of said metal member with light from said light source device; a detector for illuminating a sample with the near-field light generated at the caspidal-tip part of said metal member and detecting either light having passed through said sample or light reflected or scattered by said sample; and
a separator for extracting a signal that is synchronized with said polarization modulation from an electric signal outputted from said detector.

2. (currently amended) An optical apparatus that uses the near-field light, comprising:
a light source device for modulating the direction of polarization;
a probe that was provided with one or more metal members each having a caspidal-tip part on it;
a sample support for holding a sample;
a distance controller for controlling the distance between said sample and said probe;
an optical member for irradiating the caspidal-tip part of the metal member of said probe with light from said light source device;
at least one or a plurality of detectors-detector for illuminating said sample with the near-field light generated from said probe and detecting signal light radiated from said sample;

~~at least one or a plurality of separators~~ separator for separating and detecting a signal that is synchronized with the polarization modulation of said light source device from the signal outputted from said ~~detector(s)~~ at least one detector; and
a signal processor for processing the signal from said ~~separator(s)~~ at least one separator.

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3. (currently amended) An optical apparatus that uses the near-field light according to claim 1 or claim 2, wherein the optical apparatus is constructed in such a manner that direction of polarization of light that irradiates the ~~causidal~~ tip part of said metal member is switchable either to linearly polarized light parallel to a direction of the point of said metal member or linearly polarized light orthogonal to the direction of the point by said light source device.

4. (currently amended) An optical apparatus that uses the near-field light according to claim 1 or claim 2, wherein an apex angle of the ~~causidal~~ tip part of said metal member is 90 degrees.

5. (original) An optical apparatus that uses the near-field light according to claim 1 or claim 2, wherein a polarization compensator whose transmittance or reflectance is different depending on the polarization is disposed on an optical path of said optical member to effect compensation of polarization characteristics of other optical components.

6. (currently amended) An optical apparatus that uses the near-field light according to claim 5, wherein said polarization compensator is composed of a glass plate ~~that was disposed with its~~ so that a normal thereto is slanted to an optical axis of said optical member.

7. (original) An optical apparatus that uses the near-field light according to claim 2, wherein said probe has the shape of a multiangular pyramid or the shape of a cone with one face thereof or opposing two faces thereof being provided with said metal member.

8. (currently amended) An optical device that uses the near-field light according to claim 1, wherein said sample is a recording medium and said metal member having the ~~caspidal tip~~ tip part that was disposed on said substrate is composed in a planar shape.

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9. (currently amended) An optical apparatus that uses the near-field light according to claim 7, wherein faces of said probe other than faces on which said metal member is provided are coated with a predetermined metal and at the same time a gap smaller than a half-wavelength of the light of said light source device is provided on the ~~caspidal tip~~ tip part thereof.

10. (original) An optical apparatus that uses the near-field light according to claim 9, wherein said predetermined metal used for coating is a metal different from said metal member.

11. (original) An optical apparatus that uses the near-field light according to claim 7, wherein the thickness of said metal member that is provided on said probe is controlled to a predetermined thickness and thereby the optical apparatus is constructed in such a manner that the optical signal that has passed through said probe as propagating light and is detected by said detector is suppressed.

12. (new) An optical apparatus comprising:

a metal member disposed on a substrate so as to have at least one tip part and delimiting a narrow gap and a wide gap in orthogonal directions to one another;
a light source device which enables modulation of a direction of polarization of light;
an optical member for irradiating the gaps and the tip part with light from the light source device; and

a detector for detecting at least one of light having passed through a sample and light at least one of reflected and scattered by the sample;

wherein a direction of polarization of incident light is modulated according to the orthogonal directions and an intensity of detected light is subjected to synchronous signal detection with the modulation so that signals resulting from background light are removable and only a near-field light signal is extracted.

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13. (new) An optical apparatus that uses near-field light, comprising:
a light source device;
a probe provided with at least one metal member having a tip part;
a sample support for holding a sample;
a distance controller for controlling a distance between the sample and the probe;
a polarization modulator for modulating a direction of polarization of light from the light source device between orthogonal directions in which one of the directions is parallel to a direction of the end of the tip part of the metal member and the other direction is orthogonal thereto;
an optical member for irradiating the tip part of the metal member of the probe with light from the polarization modulator;
at least one detector for detecting signal light at least one of radiated from the sample and at least one of reflected and scattered by the sample;

at least one separator for removing a signal caused by background light and extracting only a signal of the near-field light from the signal outputted from the at least one detector; and

a signal processor for processing the signal from the at least one separator.

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14. (new) A probe method using a near-field optical microscope, comprising the steps of:

providing a probe including a metal member disposed on a substrate so as to have a narrow gap extending in one direction and a wide gap extending in an orthogonal direction;

providing a light source device for modulating a direction of polarization of light and illuminating a sample with the near-field light generated at the gaps;

providing an optical member for irradiating the gaps with light from the light source device;

providing a detector for detecting light at least one of having passed through the sample and at least one of reflected and scattered by the sample; and

modulating a direction of polarization of the incident light to the directions of the gaps and detecting an intensity of the detected light which is subjected to a synchronous signal detection with the modulation so that a signal resulting from background light is removable and only the near-field light signal is extracted.
